

# National diabetes fact sheet: general information and national estimates on diabetes in the United States, 2000

## What is diabetes?

Diabetes mellitus is a group of diseases characterized by high levels of blood glucose resulting from defects in insulin production, insulin action, or both. Diabetes can be associated with serious complications and premature death, but people with diabetes can take steps to control the disease and lower the risk of complications.

## Types of diabetes

**Type 1 diabetes** was previously called insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes. Type 1 diabetes develops when the body's immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin that regulates blood glucose. This form of diabetes usually strikes children and young adults, who need several insulin injections a day or an insulin pump to survive. Type 1 diabetes may account for 5% to 10% of all diagnosed cases of diabetes. Risk factors for type 1 diabetes include autoimmune, genetic, and environmental factors.

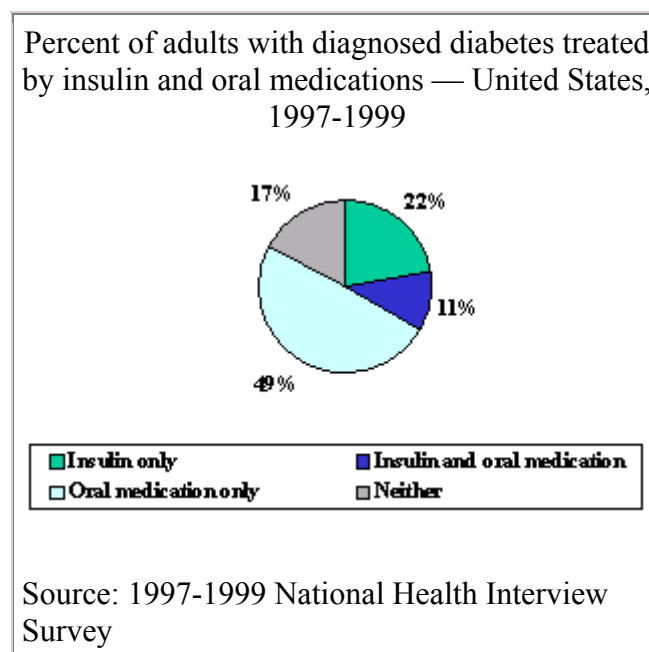
**Type 2 diabetes** was previously called non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes may account for about 90% to 95% of all diagnosed cases of diabetes. It usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce insulin. Type 2 diabetes is associated with older age, obesity, family history of diabetes, prior history of gestational diabetes, impaired glucose tolerance, physical inactivity, and race/ethnicity. African Americans, Hispanic/Latino Americans, American Indians, and some Asian Americans and Pacific Islanders are at particularly high risk for type 2 diabetes. Type 2 diabetes is increasingly being diagnosed in children and adolescents.

**Gestational diabetes** is a form of glucose intolerance that is diagnosed in some women during pregnancy. Gestational diabetes occurs more frequently among African Americans, Hispanic/Latino Americans, and American Indians. It is also more common among obese women and women with a family history of diabetes. During pregnancy, gestational diabetes requires treatment to normalize maternal blood glucose levels to avoid complications in the infant. After pregnancy, 5% to 10% of women with gestational diabetes are found to have type 2 diabetes. Women who have had gestational diabetes have a 20% to 50% chance of developing diabetes in the next 5-10 years.

**Other specific types** of diabetes result from specific genetic conditions (such as maturity-onset diabetes of youth), surgery, drugs, malnutrition, infections, and other illnesses. Such types of diabetes may account for 1% to 5% of all diagnosed cases of diabetes.

## Treating diabetes

- In order to survive, people with type 1 diabetes must have insulin delivered by injections or a pump.
- Many people with type 2 diabetes can control their blood glucose by following a careful diet and exercise program, losing excess weight, and taking oral medication.
- Many people with diabetes also need to take medications to control their cholesterol and blood pressure.
- Among adults with diagnosed diabetes, about 11% take both insulin and oral medications, 22% take insulin only, 49% take oral medications only, and 17% do not take either insulin or oral medications.



## Impaired glucose tolerance and impaired fasting glucose

- Impaired glucose tolerance (IGT) and impaired fasting glucose (IFG) are considered to be prediabetic conditions, and studies suggest that they may be reversible.
- IGT is a condition in which the blood sugar level is elevated (between 140 and 199 milligrams per deciliter or mg/dL after a 2-hour oral glucose tolerance test), but is not high enough to be classified as diabetes.
- IFG is a condition in which the fasting blood sugar level is elevated (between 110 and 125 mg/dL after an overnight fast) but is not high enough to be classified as diabetes.
- Among U.S. adults 40-74 years of age, 16.0 million (15.6%) have IGT and 10.0 million (9.7%) have IFG.

## **Preventing diabetes**

Research studies in the United States and abroad have found that lifestyle changes can prevent or delay the onset of type 2 diabetes among high-risk adults. These studies included people with IGT and other high-risk characteristics for developing diabetes. Lifestyle interventions included diet and moderate-intensity physical activity (such as walking for 2 1/2 hours each week). For both sexes and all age and racial and ethnic groups, the development of diabetes was reduced 40% to 60% during these studies that lasted 3 to 6 years.

Studies have also shown that medications have been successful in preventing diabetes in some population groups. In the Diabetes Prevention Program, a large prevention study of people at high risk for diabetes, people treated with the drug metformin reduced their risk of developing diabetes by 31%. Treatment with metformin was most effective among younger, heavier people (those 25-40 years of age who were 50 to 80 pounds overweight) and less effective among older people and people who were not as overweight.

There are no known methods to prevent type 1 diabetes. Several clinical trials are currently in progress.

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## **Preventing diabetes complications**

### **Glucose control**

- Research studies in the United States and abroad have found that improved glycemic control benefits people with either type 1 or type 2 diabetes. In general, for every 1% reduction in results of A1C blood tests, the risk of developing microvascular diabetic complications (eye, kidney, and nerve disease) is reduced by 40%.

### **Blood pressure control**

- Blood pressure control can reduce cardiovascular disease (heart disease and stroke) by approximately 33% to 50% and can reduce microvascular disease (eye, kidney, and nerve disease) by approximately 33%.
- In general, for every 10 millimeters of mercury (mm Hg) reduction in systolic blood pressure, the risk for any complication related to diabetes is reduced by 12%.

### **Control of blood lipids**

- Improved control of cholesterol and lipids (for example, HDL, LDL, and triglycerides) can reduce cardiovascular complications by 20% to 50%.

## Preventive care practices for eyes, kidneys, and feet

- Detecting and treating diabetic eye disease with laser therapy can reduce the development of severe vision loss by an estimated 50% to 60%.
- Comprehensive foot care programs can reduce amputation rates by 45% to 85%.
- Detecting and treating early diabetic kidney disease can reduce the development of kidney failure by 30% to 70%.

## National Estimates on Diabetes

### Methods

The data in this fact sheet were derived from various surveys of the Centers for Disease Control and Prevention (CDC)—the National Health Interview Survey (NHIS), the Third National Health and Nutrition Examination Survey (NHANES III), the National Hospital Discharge Survey, and surveys conducted through the Behavioral Risk Factor Surveillance System. Other data sources include CDC's National Vital Statistics System, the outpatient database of the Indian Health Service (IHS), the U.S. Renal Data System of the National Institutes of Health (NIH), and published studies. Many of the estimates were calculated from these data sources by CDC and NIH staffs.

Estimates of the total number of people with diabetes and the prevalence of diabetes (both diagnosed and undiagnosed) per 100 population are model-based estimates calculated from NHIS data, NHANES III data, and census data. Age-race-sex-specific diabetes prevalence estimates from the NHIS and the outpatient database of the IHS were applied to 2000 census estimates to calculate the number of diagnosed cases of diabetes. The total number of persons with diabetes and the number with undiagnosed diabetes were calculated using the ratio of undiagnosed to total cases of 35% and the number of persons with diagnosed diabetes. It was assumed there were no undiagnosed cases under 20 years of age because most of these cases are type 1 diabetes for which the undiagnosed period is likely to be short. Prevalence was calculated based on the total number of people with diabetes (both diagnosed and undiagnosed).

We acknowledge that the summary estimates reported in this fact sheet have some variability due to the limits of the measurements and the estimation procedures. However, it is the consensus opinion of the participating organizations that they are the best current estimates of the burden of diabetes. More detail on the data sources, references, and methods are available on request.

### Prevalence of diabetes

**Total:** 17.0 million people — 6.2% of the population — have diabetes.

**Diagnosed:** 11.1 million people

**Undiagnosed:** 5.9 million people

### Prevalence of diabetes among people under 20 years of age

About 151,000 people less than 20 years of age have diabetes. This represents 0.19% of all people in this age group.

Approximately one in every 400-500 children and adolescents has type 1 diabetes.

Clinic-based reports and regional studies indicate that type 2 diabetes is becoming more common among American Indian, African American, and Hispanic/Latino children and adolescents.

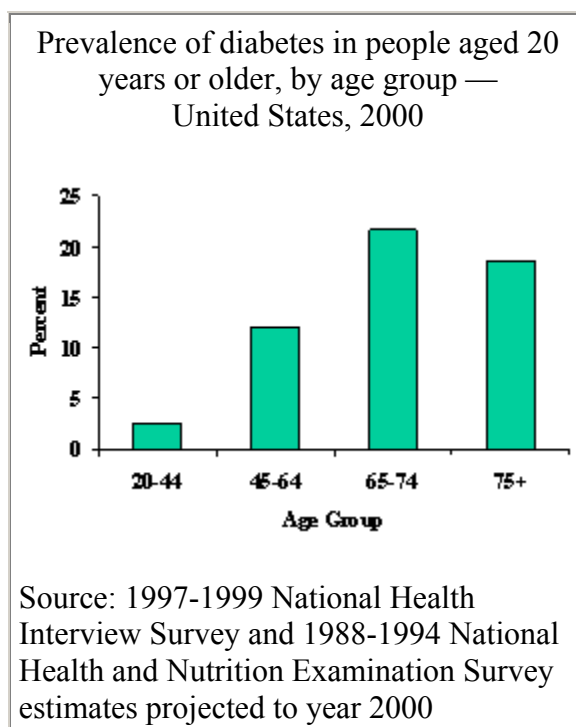
### Prevalence of diabetes among people aged 20 years or older

**Age 20 years or older:** 16.9 million. 8.6% of all people in this age group have diabetes.

**Age 65 years or older:** 7.0 million. 20.1% of all people in this age group have diabetes.

**Men:** 7.8 million. 8.3% of all men have diabetes.

**Women:** 9.1 million. 8.9% of all women have diabetes.



### Prevalence of diabetes by race/ethnicity among people aged 20 years or older

**Non-Hispanic whites:** 11.4 million. 7.8% of all non-Hispanic whites have diabetes.

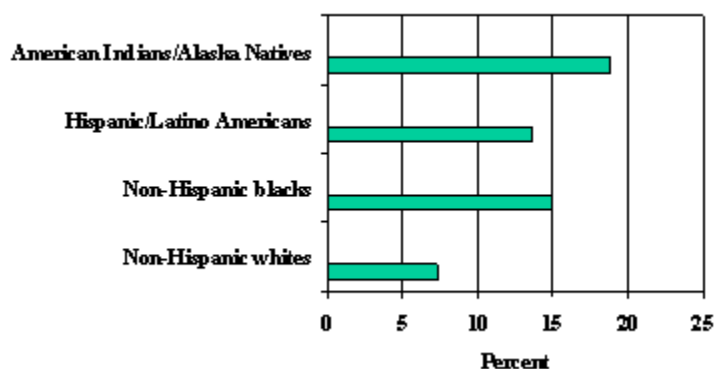
**Non-Hispanic blacks:** 2.8 million. 13.0% of all non-Hispanic blacks have diabetes. On average, non-Hispanic blacks are 2.0 times more likely to have diabetes than non-Hispanic whites of similar age.

**Hispanic/Latino Americans:** 2.0 million. 10.2% of all Hispanic/Latino Americans have diabetes. On average, Hispanic/Latino Americans are 1.9 times more likely to have diabetes than non-Hispanic whites of similar age. Mexican Americans, the largest Hispanic/Latino subgroup, are 2.0 times more likely to have diabetes than non-Hispanic whites of similar age. Similarly, residents of Puerto Rico are 2.0 times more likely to have diagnosed diabetes than U.S. non-Hispanic whites. Sufficient data are not available to derive more specific current estimates for other Hispanic/Latino groups.

**American Indians and Alaska Natives who receive care from the Indian Health Service (IHS):** 105,000. 15.1% of American Indians and Alaska Natives receiving care from IHS have diabetes. At the regional level, diabetes is least common among Alaska Natives (5.3%) and most common among American Indians in the southeastern United States (25.7%) and in certain tribes from the Southwest. On average, American Indians and Alaska Natives are 2.6 times more likely to have diabetes than non-Hispanic whites of similar age.

**Asian Americans and Native Hawaiian or other Pacific Islanders:** Prevalence data for diabetes among Asian Americans and Native Hawaiians or other Pacific Islanders are limited. Some groups within these populations are at increased risk for diabetes. For example, data collected from 1996 to 2000 suggest that Native Hawaiians are 2.5 times more likely to have diagnosed diabetes than white residents of Hawaii of similar age.

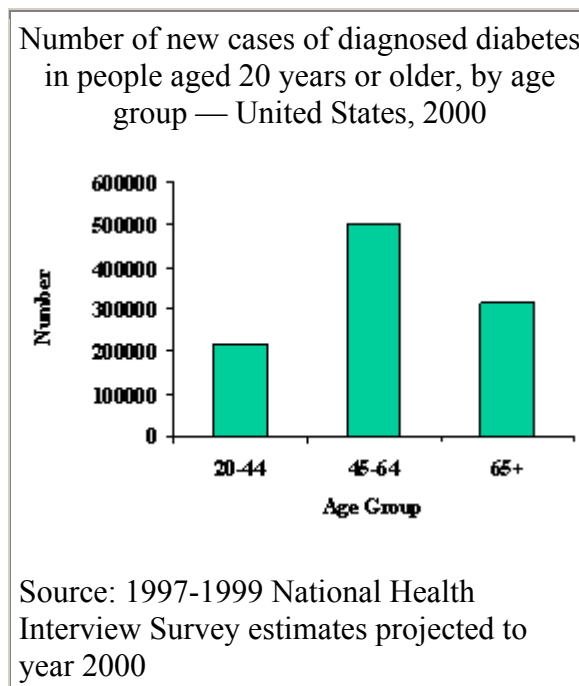
Age-adjusted prevalence of diabetes in people aged 20 years or older, by race/ethnicity — United States, 2000



Source: 1997-1999 National Health Interview Survey and 1988-1994 National Health and Nutrition Examination Survey estimates projected to year 2000. 1998 outpatient database of the Indian Health Service.

## Incidence of diabetes

**New cases diagnosed per year:** 1.0 million people aged 20 years or older.



## Deaths among people with diabetes

- In 1999, approximately 450,000 deaths occurred among people with diabetes aged 25 years and older. This figure represents about 19% of all deaths in the United States in people aged 25 years and older.
- Overall, the risk for death among people with diabetes is about 2 times that of people without diabetes. However, the increased risk associated with diabetes is greater for younger people (that is, 3.6 times for people aged 25-44 years versus 1.5 for those aged 65-74 years) and women (that is, 2.7 times for women aged 45-64 years versus 2.0 for men in that age group).
- Diabetes was the sixth leading cause of death listed on U.S. death certificates in 1999. This is based on the 68,399 death certificates in which diabetes was listed as the underlying cause of death. Diabetes was listed as a contributing cause of death on an additional 141,265 death certificates. However, many decedents with diabetes do not have the disease entered on their death certificate; only about 35% to 40% have it listed anywhere on the certificate and only about 10% to 15% have it listed as the underlying cause of death.

## **Complications of diabetes**

### **Heart disease**

- Heart disease is the leading cause of diabetes-related deaths. Adults with diabetes have heart disease death rates about 2 to 4 times higher than adults without diabetes.

### **Stroke**

- The risk for stroke is 2 to 4 times higher among people with diabetes.

### **High blood pressure**

- About 73% of adults with diabetes have blood pressure greater than or equal to 130/80 mm Hg or use prescription medications for hypertension.

### **Blindness**

- Diabetes is the leading cause of new cases of blindness among adults aged 20-74 years old.
- Diabetic retinopathy causes from 12,000 to 24,000 new cases of blindness each year.

### **Kidney disease**

- Diabetes is the leading cause of treated end-stage renal disease, accounting for 43% of new cases.
- In 1999, 38,160 people with diabetes began treatment for end-stage renal disease.
- In 1999, a total of 114,478 people with diabetes underwent dialysis or kidney transplantation.

### **Nervous system disease**

- About 60% to 70% of people with diabetes have mild to severe forms of nervous system damage. The results of such damage include impaired sensation or pain in the feet or hands, slowed digestion of food in the stomach, carpal tunnel syndrome, and other nerve problems.
- Severe forms of diabetic nerve disease are a major contributing cause of lower-extremity amputations.



## Amputations

- More than 60% of nontraumatic lower-limb amputations in the United States occur among people with diabetes.
- From 1997 to 1999, about 82,000 nontraumatic lower-limb amputations were performed each year among people with diabetes.

## Dental disease

- Periodontal or gum diseases are more common among people with diabetes than among people without diabetes. Among young adults, those with diabetes are often at twice the risk of those without diabetes.
- Almost one third of people with diabetes have severe periodontal diseases with loss of attachment of the gums to the teeth measuring 5 millimeters or more.

## Complications of pregnancy

- Poorly controlled diabetes before conception and during the first trimester of pregnancy can cause major birth defects in 5% to 10% of pregnancies and spontaneous abortions in 15% to 20% of pregnancies.
- Poorly controlled diabetes during the second and third trimesters of pregnancy can result in excessively large babies, posing a risk to the mother and the child.

## Other complications

- Uncontrolled diabetes often leads to biochemical imbalances that can cause acute life-threatening events, such as diabetic ketoacidosis and hyperosmolar (nonketotic) coma.
- People with diabetes are more susceptible to many other illnesses and, once they acquire these illnesses, often have worse prognoses than people without diabetes. For example, they are more likely to die with pneumonia or influenza than people who do not have diabetes.

## Cost of diabetes in the United States

**Total (direct and indirect):** \$132 billion (Updated May 2003) [Update](#)

**Direct medical costs:** \$92 billion

**Indirect costs:** \$40 billion (disability, work loss, premature mortality)

*These data are based on an American Diabetes Association study and are 2002 estimates of both the direct costs (cost of medical care and services) and indirect costs (cost of short-term and permanent disability, and premature death) attributable to diabetes itself. This study is a cost-of-disease study and estimates of the health care costs that are due specifically to diabetes.*

## Acknowledgments

The following organizations collaborated in compiling the information for this fact sheet:

- American Association of Diabetes Educators  
<http://www.aadenet.org> \*
- American Diabetes Association  
<http://www.diabetes.org> \*
- Centers for Disease Control and Prevention  
<http://www.cdc.gov/diabetes>  
<http://www.cdc.gov/nchs>
- Centers for Medicare and Medicaid Services  
<http://cms.hhs.gov>
- Department of Veterans Affairs  
<http://www.va.gov/health/diabetes/>
- Health Resources and Services Administration  
<http://www.hrsa.gov>
- Indian Health Service  
<http://www.ihs.gov>
- Juvenile Diabetes Research Foundation International  
<http://www.jdrf.org> \*
- National Council of La Raza  
<http://www.nclr.org> \*
- National Diabetes Education Program, a joint program of NIH and CDC  
<http://www.ndep.nih.gov>  
<http://www.cdc.gov/team-ndep>  
<http://www.cdc.gov/diabetes>
- National Institute of Diabetes and Digestive and Kidney Disease of the National Institutes of Health  
<http://www.niddk.nih.gov>
- U.S. Department of Health and Human Services, Office of Minority Health  
<http://www.omhrc.gov>

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**Citation**

Centers for Disease Control and Prevention. National diabetes fact sheet: general information and national estimates on diabetes in the United States, 2000. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2002.